# Instantaneous SARB Action Items for Aqua Edition2A Operational Software Delivery

**Table 1: General Instantaneous SARB Aqua Edition2A Delivery Information**

| Row Number | Information Description | Detail |
|---|---|---|
| 1 | Scheduled Delivery Date | November 18, 2005 |
| 2 | SCCR number | 597 |
| 3 | Software Included in delivery package | Instantaneous SARB unique code<br><br>SARBlib |
| 4 | CERESlib Delivery | N/A |
| 5 | SARB PGE(s) included in delivery | CER5.0P1<br>CER5.1P2 (new PGE)<br>CER5.4P2 (new PGE) |
| 6 | Sample Read Package | Continue with Terra Ed2B and Aqua Beta1 sample read package currently distributed with orders |
| 7 | Other Affected Subsystems | N/A |
| 8 | Documentation Updates | Test Plan<br>Operator's Manual |
| 9 | Subject Matter Experts | SCIENCE TEAM (ST):<br>Tom Charlock<br>Fred Rose<br>Dave Rutan<br>Wenying Su<br>LINUX CONVERSION:<br>Jim Donaldson<br>Henry Flippo<br>Danny Mangosing |

Action Item List Status - All Action Items completed. This list now CLOSED.

**Table 2: Instantaneous SARB Aqua Edition2A Delivery Action Items**

| Action Item | Requirement Definition | Status Update | Verification of completion |
|---|---|---|---|
| Implement SARB Requirement 5-1.0 | Email 1. Tom Charlock, 7/28 10:18, Item #2 (included "> >>" email)<br><br>Email 10. Sets delivery date | Email 9. Points to ST log of changes | Email 33. Release of delivery from CM to ASDC |
| Implement SARB Requirement 5-1.1 | Email 3., Fred Rose Item 1 (included email)<br>Email 24. Background info | Email 6. Details from ST<br>Email 17. Status update | Email 12.<br>Email 29. |
| Implement SARB Requirement 5-1.2 | Email 3., Fred Rose Item 2 (included email) | Email 2. Receipt of contributed code<br>Email 9. General status<br>Email 19. Status - location of files for ST evaluation<br>Email 20. Mid-way verification of direction from ST | Email 12.<br>Email 29. |
| Implement SARB Requirement 5-1.3 | Email 3., Fred Rose Item 3 (included email) | Email 9. General status<br>Email 17. Status-unit test report<br>Email 27. Directions | Email 12.<br>Email 29. |
| Implement SARB Requirement 5-1.4 | Email 3., Fred Rose Item 4 (included email) | Email 9. General status<br>Email 14. Modification details from ST<br>Email 15. Unit test in progress | Email 12.<br>Email 29. |
| Implement SARB Requirement 5-1.5 | Email 1.<br>Fred Rose, 7/28 14:04, paragraph 2<br><br>Email 3., Fred Rose Item 6 (included email) | Email 7. Receipt of contributed code and general directions<br>Email 9. General status | Email 12.<br>Email 29. |
| Implement SARB Requirement 5-1.6 | Email 1.<br>Tom Charlock, 7/28 10:18, Item #1 (included email)<br><br>Email 3., Fred Rose Item 1 (included email) | Email 4. Receipt of ST code | Email 5. Removal of requirement |

Action Item List Status - All Action Items completed. This list now CLOSED.

**Table 2: Instantaneous SARB Aqua Edition2A Delivery Action Items**

| Action Item | Requirement Definition | Status Update | Verification of completion |
|---|---|---|---|
| Implement SARB Requirement 5-1.7 | Email 11. | | Email 32. |
| Implement SARB requirement 5-2.1 | Email 3., Fred Rose Item 7 (included email)<br>Email 25. Require-ment re-stated | Email 7. (Item B) - Interface details<br>Email 8. - Requirement clarification | Email 29. |
| Implement SARB requirement 5-2.2 | Email 3., Fred Rose Item 4 (included email) | Email 14. ST update to code provided earlier, demonstration of iterative pro-cess | Email 29. |
| Implement SARB requirement 5-1.8 and 5-2.4 | Email 28. | Email 16. Stauts update<br>Email 21. CVS update<br>Email 22. CVS update<br>Email 23. CVS update<br>Email 26. General update - results ready for evaluation | Email 28. |
| Implement SARB Requirement 5-3.0 | Email 10. | Email 13. General progress report | Email 30. |
| Implement SARB Requirement 5-4.0 | Email 10. | Email 13. General progress report | Email 30. |
| Update Documenta-tion (Table 1, Row 8) | Routine requirement with all deliveries | | Email 31.<br>Email 33. |

# Email 1.

Date: Thu, 28 Jul 2005 14:05:36 -0400
From: Fred Rose <f.g.rose@larc.nasa.gov>
To: Tom Charlock <Thomas.P.Charlock@nasa.gov>
CC: Lisa Coleman <L.H.Coleman@larc.nasa.gov>
Subject: Re: Wanted:  Cleanup of IGBP map for Aqua/ SARB redelivery

Tom,

Much of the work has already been done.
cerfu20050726 was delivered to DMT(Lisa,Scott,Tom)

It contained the fix for Ice Cloud Dir/Dif,
Par_400_700,PAR_Purves,PAR_ChlA as well as the
Direct/Diffuse for each.

The remaining work is deciding what is wanted on the CRS
asd passing the parameters from FU to CRS..
Changing the format of CRS by adding parameters always
causes headches having multiple versions of read routines...

Changing IGBP would also require a new seperate version of
the Surface Albedo History Map (SAH) . The structure of SAH
is tied to the # and location of non-ocean Igbp 10' boxes.
So change the IGBP static map a new version of SAH (code and product)
would then be needed.

>From a global perspective , making sure the CLOUD WG is properly
updating CRH and passing the Cloudy Sky FOV Snow_ice % thru ADMGEO parameter,
would probably impact global mean CRS more than minor IGBP map changes.
SARB CRS alters our internal FOV IGBP vector on a FOV by FOV basis
based on the Cloud WG classification of SnowIce..
So  I have little worry about us fixing one 25km region to
have another IGBP value.

If you are worried about CLOUDS and INVERSION then change IGBP static map.
If the only concern is SARB then don't bother with the IGBP static map.

Tom Charlock wrote:
>
> Fred,
>
> It appears that Aqua "Edition2" processing will retain the awful
> IGBP cropland near COVE.
>

> In my first reply to Lisa, I suggested that we could use the
> jury-rigged fix of the subset ru-run (not using land when within
> 25 km of COVE) for Aqua Edition 2 CRS. THAT WAS A BAD
> IDEA. Given the mess in the inputs near COVE, it would
> give only a partial fix; this okay for internal use, but too hard
> to justify to outsiders for official processing.
>
> You have a change to the code for direct/diffuse broadband
> with ice clouds. Is it easy to also put in the new 400-700 nm
> PAR (not with separate direct/diffuse components) into
> a new delivery for Lisa?
>
> If a new delivery is too big a deal, I don't want to wear out the
> DMT with it.
>
> Tom
>
> At 12:23 PM -0400 7/28/05, l.h.coleman@larc.nasa.gov wrote:
> >Tom,
> >
> >The IGBP map is accessed by the Cloud retrieval software,
> >which in turn provides the pixel-level information to the
> >Convolution software for convolving into FOV values. The
> >SARB software obtains the convolved values from the SSF
> >and not directly from the IGBP map. That means I do not
> >have the authority to correct the map for Aqua. The
> >information I have is that Cloud retrieval and convolution
> >are not planning to rerun for this Edition2A. If we were
> >to put something in the CRS code to access corrected values,
> >there would be a disconnect between the values supplied by
> >Clouds and stored on the SSF and what SARB uses. What SARB
> >uses would not be written to the output CRS, as we may not
> >overwrite the values supplied on the SSF.
> >
> >Now, I am hearing rumblings of Edition3 processing. I think
> >Bruce is starting to gather information on what exactly needs
> >to be processed before making any decisions.
> >
> >I hope I have provided some useful insight.
> >
> >Lisa
> >
> >
> >
> >
> >On Jul 28, 10:18am, Tom Charlock wrote:

> >> Subject: Wanted: Cleanup of IGBP map for Aqua/ SARB redelivery
> >> Lisa,
> >>
> >> Thank you for bringing this issue forward.
> >>
> >> 1. I favor the use of a new IGBP map for ALL Aqua processing,
> >> both SSF and CRS. See attached CleanupAquaIGBPmap.pdf
> >> and please circulate to the other WGs as appropriate. I know
> >> that Pat Minnis would like to see the cleanup. Do you have the
> >> authority to correct the IGBP map for Aqua?
> >>
> >> 2. Your issue of a possible new delivery of the SARB code for
> >> Aqua CRS: I vote "yes" but encourage the expression of other
> >> views before deciding.
> >>
> >> We have a partial fix to the COVE cropland problem (wrong
> >> IGBP assignment near COVE); it should be used if we don't
> >> get a better IGBP map. Beyond that, it would be boost to
> >> replace the "PAR", now made by Terra Edition 2B, with
> >> a new 400-700 nm PAR; this would swap one output for
> >> a new one, and not add more outputs.
> >>
> >> Tom
> >>
> >>
> >> . At 9:24 AM -0400 7/28/05, l.h.coleman@larc.nasa.gov wrote:
> >> >Tom and Fred,
> >> >
> >> >Norm Loeb is due to deliver new Aqua ADMs in the fall,
> >> >allowing for the production of Edition2A Aqua SSF files.
> >> >The Instantaneous SARB is, of course, due to process
> >> >using the Edition2A SSF files, generating the Aqua
> >> >Edition2A CRS data set. The question on the table
> >> >is whether or not we need to make a new delivery of
> >> >the SARB code for Aqua Edition2A CRS processing.
> >> >
> >> >Lisa
> >> >
> >> >--
>--
Fred G. Rose (757)827-4649
http://srbsun.larc.nasa.gov/~rose/
f.g.rose@larc.nasa.gov

# Email 2.

Date: Thu, 19 May 2005 15:24:18 -0400
From: Fred Rose <f.g.rose@larc.nasa.gov>
To: Scott Zentz <s.m.zentz@larc.nasa.gov>
CC: Lisa Coleman <L.H.Coleman@larc.nasa.gov>,
Tom Charlock <Thomas.P.Charlock@nasa.gov>,
Dave Rutan <D.A.rutan@larc.nasa.gov>,
Zhonghai Jin <z.jin@larc.nasa.gov>
Subject: A request to test modified cloudy sky coastal surface albedo in CRS

Scott,

One issue that we have with our current CRS ED2B runs is
the Cloudy Surface Albedo for "Coastal" Fovs.
Currently we pull a land Surface albedo from history map(SAH),
if the FOV falls within a SAH land grid box(10minute).
This can give a large overestimate of surface albedo if the FOV is
Coastal(1%< ocean% <99% .and no ice or snow) but primarily ocean.
One of our primary validation sites COVE, falls in one of these SAH
grid boxes, so for cloudy sky COVE gets a land surface albedo.
For conditions of thin cloud this gives us problems in matching TOA
observed SW Flux.

To try and solve this have made some UNCOMPILED and UNTESTED changes to
one of the MODULES in SARBLIB "/CERES/sarb/lib/src/Spectral_Sfc.f90"
the modifications are fairly minor just dealing with a simple change to introduce
logic for a coastal condition and to call the Z.Jin ocean albedo routine for
the part of the FOV that is Ocean, where the IGBP based surface albedo averaging occurs.
Before only a crude spectral ocean albedo was used in this part of the code.

The modified module is
/CERES/sarb/home/rose/specsfc/Spectral_Sfc_200505.f90

gdiff /CERES/sarb/home/rose/specsfc/Spectral_Sfc_200505.f90
/CERES/sarb/lib/src/Spectral_Sfc.f90

Could you produce a test run by

1) Swap the module "Spectral_Sfc_200505.f90" for the existing Spectral_Sfc.f90
2) See if it compiles in the SARB environment, if not let me know....

3) Make a run for the first 1000 fovs of
CER_CRSB_Terra-FM1-MODIS_Edition2B_018024.2001071916
and tell me the location of the output file so I can see if it works.

These 1000 FOV's fall over COVE during CLAMS on a day that has considerable thin cloud
A time and location where this problem is near its worst.

--
Fred G. Rose (757)827-4649
http://srbsun.larc.nasa.gov/~rose/
f.g.rose@larc.nasa.gov

## Email 3.

Date: Wed, 03 Aug 2005 11:25:31 -0400
From: Fred Rose <f.g.rose@larc.nasa.gov>
To: Lisa Coleman <L.H.Coleman@larc.nasa.gov>,
Scott Zentz <s.m.zentz@larc.nasa.gov>
CC: Tom Charlock <Thomas.P.Charlock@NASA.GOV>
Subject: Re: Aqua Ed1 CRS

Lisa,Scott

Can we set up an SCF test of AQUA including ALL the changes
that have been made to our "transition" code ( which has been the basis of
tests for Feb 2002 Val Subset runs) for a first an HOUR and then a DAY of
FULL CRS.

I have not worked with Beta Aqua CRS but I'd like to find an hour with lots
of daytime coast, polar and non-polar.

Once this HOUR and/or DAY is run will look at the differences between it an the BETA
Aqua.

Then by that time I will send another change dealing with a further redefinition of
Coast using a SARB cookicutting of the CERES H20 percent 10' map.

Finally these changes should be tested with another HOUR and /or DAY run.

Fred Rose wrote:
>
> Tom
> What do you want to try to include for "Aqua Ed1 CRS"?
> Lisa is asking about finalizing for a code delivery?
>
> The last version included the 25km surrounding Cove treated as ocean.
> Do you want to try and use the "under test" SARB cookie cut H20 map for
> the COAST determination?

> I've discovered my cookie cutter is very slow near the poles.
> I can bypass this if all that is needed is H20%
> ( 100% > ~85N , 0% < ~85S) , Sfc Elevation would need the brut force
> averaging of the 2160 eq angle 10' grid boxes.
>
> Other changes that in the pipe or are options for AQUA ED1 CRS
>
> 1)Fix of Surface albedo retrieval when Match AOT < 0.0001
> 2)Change in surface albedo logic for Cloudy Sky Coast.
> 3)Change in surface albedo logic for Clear  Sky Coast.
> 4)Change in Cloudy Sky Surface ALbedo retrieval over snow.(ASSALUT)
> 5)Change in spectral shape in UV region.
> 6)Fix of Ice Cloud direct diffuse. ( cerfu20050726)
> 7)Change in definition of PAR. ( cerfu20050726)
>
> --
> Fred G. Rose (757)827-4649
> http://srbsun.larc.nasa.gov/~rose/
> f.g.rose@larc.nasa.gov

## Email 4.

Date: Thu, 04 Aug 2005 12:53:25 -0400
From: Fred Rose <f.g.rose@larc.nasa.gov>
To: Scott Zentz <s.m.zentz@larc.nasa.gov>
CC: Lisa Coleman <L.H.Coleman@larc.nasa.gov>
Subject: Sarb H20 cookie cutter for CRS

Scott
Here is a F90 Module that uses the H20% map
and assumes a Circular FOV inputting ( Latitude,Longitude , View Zenith Angle)
and output a H20% .
There is also a routine in the same module that takes
the IGBP vector type and area and adjusts it to a new water%.

"subroutine CRS_implementation_example"
tests and shows how the routines would be used in the CRS code.

"subroutine readin_h2o_map" would need to be rewritten to conform to the
DAAC coding standards for I/O

I'd suggest not making many changes to the Module, if it can be avoided to
keep its standalone nature intact for testing.

The only issue I see is  the first line in the module
real, parameter ::  h = 703  ! TERRA or AQUA  ! Satellite Altitude in Km

!real, parameter ::  h = 350 ! TRMM ! Satellite dependent
 Parameter h "Satellite Altitude (KM)" needs to be accesed
 from some other source based on the satellite being processed.

"log" give a set of test example outputs...

--
Fred G. Rose (757)827-4649
http://srbsun.larc.nasa.gov/~rose/
f.g.rose@larc.nasa.gov

[ Attachment (text/plain): "sarb_cookie.f90" 10779 bytes
  Character set: us-ascii ]

[ text/plain ] :

```
Case ,VZA ,Water%-->   1     0.0    90.7
T1  17   0   0   0   0   0   0
A1 100   0   0   0   0   0   0
T2  17  12   0   0   0   0   0
A2  91   9   0   0   0   0   0
 ----
Case ,VZA ,Water%-->   2     0.0    90.7
T1   1  12   4   7   8   9  10
A1  70  10   5   6   5   1   3
T2   1  12   4   7   8  17  10
A2   7   1   0   1   0  91   0
 ----
Case ,VZA ,Water%-->   3     0.0    90.7
T1  17  12   4   7   8   9  10
A1  70  15   5   4   3   1   2
T2  17  12   4   7   8   9  10
A2  90   5   2   1   1   0   1
 ----
Case ,VZA ,Water%-->   1    35.0    78.3
T1  17   0   0   0   0   0   0
A1 100   0   0   0   0   0   0
T2  17  12   0   0   0   0   0
A2  79  21   0   0   0   0   0
 ----
Case ,VZA ,Water%-->   2    35.0    78.3
T1   1  12   4   7   8   9  10
A1  70  10   5   6   5   1   3
T2   1  12   4   7   8  17  10
A2  15   2   1   1   1  79   1
 ----
```

```
Case ,VZA ,Water%-->   3    35.0    78.3
T1  17  12   4   7   8   9  10
A1  70  15   5   4   3   1   2
T2  17  12   4   7   8   9  10
A2  78  11   4   3   2   1   1
 ----
Case ,VZA ,Water%-->   1    70.0    57.0
T1  17   0   0   0   0   0   0
A1 100   0   0   0   0   0   0
T2  17  12   0   0   0   0   0
A2  58  42   0   0   0   0   0
 ----
Case ,VZA ,Water%-->   2    70.0    57.0
T1   1  12   4   7   8   9  10
A1  70  10   5   6   5   1   3
T2   1  12   4   7   8  17  10
A2  30   4   2   3   2  58   1
 ----
Case ,VZA ,Water%-->   3    70.0    57.0
T1  17  12   4   7   8   9  10
A1  70  15   5   4   3   1   2
T2  17  12   4   7   8   9  10
A2  58  21   7   6   4   1   3
 ----
 Normal End -- CRS_implementation_example
```

## Email 5.

Date: Tue, 9 Aug 2005 10:03:47 -0400 (EDT)
From: "Scott M. Zentz" <szentz@saisun18.larc.nasa.gov>
Reply-To: "Scott M. Zentz" <szentz@saisun18.larc.nasa.gov>
Subject: Re: Aqua runs
To: f.g.rose@larc.nasa.gov
Cc: l.h.coleman@larc.nasa.gov

Lisa,

You full day of 20030629 is complete.  the files are in the usual directory.

/CERES/sarb-1/zentz/sarb/data/out_comp/data/sarb

Scott

>Date: Mon, 08 Aug 2005 12:42:31 -0400
>From: Fred Rose <f.g.rose@larc.nasa.gov>

>X-Accept-Language: en
>MIME-Version: 1.0
>To: "Scott M. Zentz" <szentz@saisun18.larc.nasa.gov>
>Subject: Re: Aqua runs
>Content-Transfer-Encoding: 7bit
>
>Scott,
>In that case I think the next step is to run the FULL DAY  of 20030629.
>From there I can look at the diferences between it and the BETA1 AQUA.
>
>"Scott M. Zentz" wrote:
>>
>> Fred,
>>
>> The code has been succesfully unmodified.
>>
>> Scott
>>
>> >Date: Mon, 08 Aug 2005 12:14:05 -0400
>> >From: Fred Rose <f.g.rose@larc.nasa.gov>
>> >X-Accept-Language: en
>> >MIME-Version: 1.0
>> >To: "Scott M. Zentz" <szentz@saisun18.larc.nasa.gov>
>> >CC: Lisa Coleman <L.H.Coleman@larc.nasa.gov>, Tom Charlock
>> <Thomas.P.Charlock@nasa.gov>
>> >Subject: Re: Aqua runs
>> >Content-Transfer-Encoding: 7bit
>> >
>> >Scott,
>> >       For the upcoming AQUA code:
>> >
>> >A) NO Special treatment of Cove surface albedo logic
>> >Change from:
>> > IF (  ocean_pct >= 99. .OR.  dist(36.900,284.290,ss%rlat,ss%rlon) < 25)
THEN
>> >Change To:
>> > IF (  ocean_pct >= 99.) THEN
>> >End Change:
>> >
>> >B) Water Map included before SARB processing.
>> > Do NOT use the routines
>> >  h2o_cookie
>> >  h2o_igbp_adjust
>> >
>> >
>> >  REMOVE THIS ITEM FROM THE documentation list of AQUA Changes

>> >   8) FOV Convolution of  H2O% map in SARB...
>> >
>> >
>> >   The convolution of the IGBP vector for AQUA has been changed to include
>> >   information from the H2O% map at the proper point in CERES processing
>> "Convolution".
>> >   Therefor any need for SARB to alter the IGBP vector to include H2O map
>> >   data for AQUA is now unnecessary.
>> >   As a result, the IGBP vector near COVE and elsewhere  will be more
accurate
>> >   than it was for TERRA or TRMM.
>> >
>> >I do not know of any plans for reprocessing of TERRA or TRMM in the near
>> >future. If and when this might  occur we would reacess the state of the
>> >IGBP scene vector and any need for changes.
>> >
>> >
>> >
>> >
>> >
>> >"Scott M. Zentz" wrote:
>> >>
>> >> Fred,
>> >>
>> >> Just to be clear.  I need to remove the code modification that treated
>> anything
>> >> near cove as Ocean.  Which is:
>> >>
>> >> IF (  ocean_pct >= 99. .OR.  dist(36.900,284.290,ss%rlat,ss%rlon) < 25)
THEN
>> >>
>> >> Also I am to remove the H2O map stuff specifically the call to h2o_cookie.
>> Am I
>> >> also supposed to remove the call to h2o_igbp_adjust?  Are these changes
>> across
>> >> the board for Terra and TRMM as well, not just Aqua?
>> >>
>> >> Scott
>> >>
>>

# Email 6.

Date: Mon, 16 May 2005 14:08:41 -0400
From: Fred Rose <f.g.rose@larc.nasa.gov>
To: Lisa Coleman <L.H.Coleman@larc.nasa.gov>

CC: James Donaldson <j.l.donaldson@larc.nasa.gov>,
Scott Zentz <s.m.zentz@larc.nasa.gov>,
"T.E Caldwell" <T.E.CALDWELL@larc.nasa.gov>
Subject: Match Vertical Profile Data & wssacomp (SARBLIB)

Lisa Coleman,

I)
The  MATCH VERTICAL PROFILE data in

/CERES/sarb/home/rose/terra/match/vertical/processed
MATCH_TERRA_VERTICAL_MODIS.yyymmdd
daily data : 20000101 - 20041231
Looks OK to be used for future processing!
It has passed basic inspection for a few days of the new
(july2003-dec2004) files.

Also :
/CERES/sarb/home/rose/terra/match/modis/processed
MATCH_TERRA_AOTS_MODIS.yyymmdd
contains the Match Optical Depth files for the same period
A more complete QC global TOTAL AOD maps can be accessed thru.
http://snowdog.larc.nasa.gov/cgi-bin/rose/match/aodmap.cgi

II)
Back in November of last year there was a bug discovered in the
use of the profile data however. The bug is NOT severe,
it only causes under some conditions layers with zero AOT
but the AOD is put in layers close to where it is intended.

An attached corrected version of the subroutine "get_match_vertical_profiles_200411.f90"
which is contained in the module "/CERES/sarb/lib/src/match_profiles.f90" Begining@line
189
should be swaped in upon next SARBLIB delivery !

III)
Also upon next SARBLIB delivery, in the file "wssacomp.f90"
the line
"getwssa=getwssa/saot"
should be trapped for division by zero and the
value 0.0 should then be assigned to getwssa for that condition.
This is the fix to a bug causing bad surface albedo retrieval
when match AOT is less than 0.0001

I’m not sure if the necessity of this fix for a future version
was passed on to you by Scott.

Lisa, Please acknowledge this email with some form of an email reply.
This will act as my pseudo-formal confirmation of informing "Data Managment"
of these items relating to SARB.

--
Fred G. Rose (757)827-4649
http://srbsun.larc.nasa.gov/~rose/
f.g.rose@larc.nasa.gov

[ text/plain ] :

```
!=====================================================================
! This subroutine should be contained within module "MATCH_PROFILES"
! It is a revision to fix a logic bug and a correction for non constant
! pressure thickness ...F.Rose Nov2004

subroutine get_match_vertical_profiles
integer ilat,ilon
integer k,ip,i
real psfc,p1,p2,px,yyy,dp,pt,pb,sdp,plast
real ttt(np) , ttt_comb(npc)
real vslice(nlev,np)
real asm1(np)
real nsm1
real dpp(mlev),sdpp
!print*,’ RAW MATCH PROFILE’
ilat =  match_lat(mpro%rlat)
ilon =  match_lon(mpro%rlon)
psfc=    mpro%pp(mpro%nv1)

mpro%np = np
mpro%npc = npc
mpro%mlev = mlev
! UPACK into ARRAY vslice
do k=1,nlev
do ip=1,np
 vslice(k,ip) = upbv( ipout(ilon,ilat,k,ip) ) !UNPACK to array
enddo


!print’(2f8.1,2I4,3f8.3,i3,10f6.1)’,rlatca(ilat),rlonca(ilon),ilat,ilon,&
!hybi(k)*psfc,press(k)*psfc,hybi(k+1)*psfc &
```

```
!,k,vslice(k,1:np)
enddo
!---------------------------------------
! Vertical integration into Percentage profiles....for desired pressure levels
!defining model layers...

mpro%mvp =0.0

plast = 0.000!  mpro%pp(1)
OUTLEV : do i = 1, mpro%nv1-1
p1 = mpro%pp(i)
p2 = mpro%pp(i+1)
dpp(i) = p2-p1

asm1=0
nsm1=0
INLEV: do k = 1,nlev
 px = press(k)  *psfc
 pt = hybi(k) *psfc
  pb= psfc
  if ( k .ne. nlev) pb= hybi(k+1) *psfc
 dp =0

!if(  ( px > p1 .and. px <=  p2) .or. &
!      (p1 > pt .and. p2 <= pb)) then
if(   (p1 >= pt .and. p2 <= pb ) .or. &
      (pt >= p1 .and. pb <= p2 ) .or.&
      (p1 >= pt .or. p2 >= pb ) .and. ( p1<=pb .or. p2<= pb) ) then


dp = pb-plast  ! without
if (dp == 0 ) cycle

if ( p2 < pb ) dp = p2-plast


plast = plast+dp


asm1(1:np)= asm1(1:np)+ vslice(k,1:np) * dp
nsm1= nsm1+dp

!!!!print'(2(I4,2f8.1,3x),5f8.4)',i,p1,p2,k,pt,pb,  dp

endif
```

```
enddo INLEV

if( nsm1 > 0 ) mpro%mvp(i,1:np) =  asm1(1:np)/ nsm1

enddo OUTLEV
!!!-----------------------------------------------------------
!!! Renormalize and Combine constituents.
!print*,'DPP', mpro%nv1-1, dpp(1:mpro%nv1-1)
!stop'pre'
ttt_comb =0
mpro%mvp_comb =0

sdpp            = sum(dpp(1:1:mpro%nv1-1) )
dpp(1:1:mpro%nv1-1) = dpp(1:1:mpro%nv1-1)/sdpp


do ip=1,np
mpro%mvp(1:mpro%nv1-1 ,ip )= mpro%mvp(1:mpro%nv1-1 ,ip)* dpp(1:mpro%nv1-1)

ttt(ip) = sum( mpro%mvp(1:mpro%nv1-1 ,ip)    )

ttt_comb( icx(ip) ) = &
ttt_comb( icx(ip) ) + ttt(ip)

mpro%mvp_comb( 1:mpro%nv1-1, icx(ip)  ) = &
mpro%mvp_comb( 1:mpro%nv1-1, icx(ip)  ) + mpro%mvp( 1:mpro%nv1-1, ip  )

enddo

!print*, ttt(1:np)
do i = 1, mpro%nv1-1
mpro%mvp(i,1:np)      = 100.*mpro%mvp     (i,1:np)/ttt(1:np)
mpro%mvp_comb(i,1:npc)= 100.*mpro%mvp_comb(i,1:npc)/ttt_comb(1:npc)
!!!!print'(i4,f8.1,10f8.2)',i,mpro%pp(i) ,mpro%mvp_comb(i,1:npc)
enddo

end subroutine get_match_vertical_profiles
```

# Email 7.

Date: Mon, 25 Jul 2005 13:49:40 -0400
From: Fred Rose <f.g.rose@larc.nasa.gov>
To: Lisa Coleman <L.H.Coleman@larc.nasa.gov>
Subject: Update of CERES Fuliou Code

Lisa

I took the version of Fuliou in

lightning:/CERES/sarb/lib/src

Modified and Added  subroutines to
A) Fix the Direct and Diffuse for Ice Clouds (from March 2005)
B) Revised the computation of PAR according to
definitions and LUT's from Wenying. (July 2005)
!! Caution  the modified files contain the same names as those in
lightning:/CERES/sarb/lib/src

Here are the resulting output structures.

```
fsfc(1:4)%dirsfc !  Broadband SW Surface Direct
fsfc(1:4)%difsfc !  Broadband SW Surface Diffuse
fouv(1:4)%par         ! 400:700nm SW PAR
fouv(1:4)%par_rdirdif ! 400:700nm SW PAR Direct diffuse ratio

fouv(1:4)%par_purv         ! Purves Action Spectrum SW PAR
fouv(1:4)%par_purv_rdirdif ! Purves Action Spectrum SW PAR Direct diffuse ratio

fouv(1:4)%par_chla         ! Chloraphyll_A Action Spectrum SW PAR
fouv(1:4)%par_chla_rdirdif ! Chloraphyll_A Action Spectrum SW PAR Direct diffuse ratio
```

Where
1= Clear w/aerosol
2= Total Sky w/aerosol
3= Pristine
4= Cloudy no Aerosol

The attached tar file contains the modified code and
"ATESTPROGRAM.f90"

For the purpose of modification and testing
added  FRED.f90 to make the code standalone
it's just a parameter statement...
You won't need FRED.f90 when attaching to your SARBLIB...

We can go over this tomorrow morning.
--
Fred G. Rose (757)827-4649
http://srbsun.larc.nasa.gov/~rose/
f.g.rose@larc.nasa.gov

[ Attachment (application/x-tar): "cerfu20050725.tar" 4928096 bytes
  Encoded with "base64" ]

## Email 8.

Date: Wed, 28 Sep 2005 15:13:08 -0400
From: Fred Rose <f.g.rose@larc.nasa.gov>
To: Tom Charlock <Thomas.P.Charlock@nasa.gov>, Wenying Su <w.su@larc.nasa.gov>,
      Scott Zentz <s.m.zentz@larc.nasa.gov>,
      Lisa Coleman <L.H.Coleman@larc.nasa.gov>
CC: David Rutan <d.a.rutan@larc.nasa.gov>
Subject: Re: PAR Validation

Tom,Wenying
As suspected the output of PAR in the 'AQUA' CRS remains
as fu bands(8:10). The additions of (400:700 PAR) and (PURVES PAR)
were made for the upcoming SYN code.

Scott reported me that no change was directly
requested to the PAR output variable in CRS.

I think there was confusion on
and if this was for SYN alone or SYN and CRS.
and  which new  variable to use.

Also this would require a change in the documentation
of CRS outputs. I assume we would want to REPLACE
the current PAR , NOT add parameters to the CRS.

IF YOU WANT TO REPLACE PAR ON CRS  WITH A NEW DEFINITION,
which one would it be.

A) 400:700 PAR
B) PURVES PAR

Tom Charlock wrote:
>
> David,
>
> I think you can show something like this.  Congradulations
> on being agile.
>

> Fred is going to check, and see if the "Pre Edition" Aqua will
> run with the "right" PAR.
>
> Tom
>
> Your comparisons could refer to . At 1:58 PM -0400 9/28/05, David Rutan wrote:
> >Tom,
> >
> > Attached is a first look at PAR comparisons made
> >between CRS results and SURFRAD observations. Though
> >we know it (PAR on CRS) is wrong the first idea here is
> >to find out how wrong and show that perhaps it is not
> >that bad. The second idea is would it be okay to advertise
> >a "corrected" PAR at the iLEAPS meeting, with the caveat
> >that appropriate corrections are coming in the next
> >version?
> >
> > The basic outline is a direct comparison first, then
> >a simple correction based on difference in spectrum observed
> >by the SURFRAD instruments compared to Fu bands. (Using
> >Zhonghai's model to calculate the incoming SW flux under
> >a SINGLE condition.) Then applying the correction and
> >looking at it again. (Remaing plots are ancillary just
> >looking for relationships.)
> >
> > It's rudimentary and I know Wenying has made changes to
> >address it in a more detailed manner. But it certainly
> >looks as if the major contributor to the difference is
> >the mismatch in wavelength.
> >
> > Would you feel comfortable if we showed something like
> >this or is there too much hand-waving?
> >
> >.....David
> >

## Email 9.

Date: Wed, 17 Aug 2005 14:05:21 -0400
From: Fred Rose <f.g.rose@larc.nasa.gov>
To: Scott Zentz <s.m.zentz@larc.nasa.gov>
CC: Lisa Coleman <L.H.Coleman@larc.nasa.gov>,
Dave Rutan <D.A.rutan@larc.nasa.gov>,
Tom Charlock <Thomas.P.Charlock@nasa.gov>
Subject: Aqua PreEd1 Testing

Scott,
Hopefully we are getting close to the end of revisions
for the Pre_ED1 Aqua CRS code.
Only Tom Charlock knows for sure if this is it for changes.

Here is my log of changes and some test plots
from BETA1_CRS_Aqua code to PRE_ED1_CRS_Aqua.
http://srbsun.larc.nasa.gov/ceres/aqua/

As an addition to the test on a single day we have been doing 20030629.
We want to do a full month test on the Validation Subset data.
I'm throwing out June 2003 FM3 as a suggestion.
I'd prepair a run thru the latest version of software we've tested.

Once it is done Dave Rutan can run his CAVE validation code to
check out the changes from CRS_Beta1_FM3.

--
Fred G. Rose (757)827-4649
http://srbsun.larc.nasa.gov/~rose/
f.g.rose@larc.nasa.gov

## Email 10.

Date: Mon, 22 Aug 2005 14:13:40 -0400
To: l.h.coleman@larc.nasa.gov
From: Tom Charlock <Thomas.P.Charlock@nasa.gov>
Subject: discussion on Aqua Edition 2 CRS delivery
Cc: Fred Rose <f.g.rose@larc.nasa.gov>

Lisa,

The expectation at the meeting was, that you would make a delivery
of new SARB software for Aqua Edition 2 CRS in mid November.
This would be for the (jolly?) IBM cluster.

To meet this schedule, should we get the final code to you in
late October?

Tom

At 1:08 PM -0400 8/22/05, l.h.coleman@LARC.NASA.GOV wrote:
>Tom,

>
>Any report from the scheduling meeting the Friday before last?
>Do we continue with planning to deliver new SARB software for
>the Aqua Edition2 CRS data set?
>
>Lisa
>
>
>On Aug 10, 1:09pm, Tom Charlock wrote:
>> Subject: CERES schedule Fwd: Friday 3-4pm, Rm161
>>
>> Lisa, Fred, and David,
>>
>> This is a forwarding on the CERES schedule. The document in in Excel, so
>> I've attached a version of it as pdf (if anyone lacks Excel software...).
>>
>> Tom
>>
>> >Date: Wed, 10 Aug 2005 12:43:40 -0400
>> >To: k.j.priestley@larc.nasa.gov,
>> > p.minnis@nasa.gov,
>> > N.G.LOEB@larc.nasa.gov,
>> > t.p.charlock@larc.nasa.gov,
>> > TAKMENG.WONG@larc.nasa.gov,
>> > David Doelling <D.R.DOELLING@larc.nasa.gov>,
>> > Michael Little <M.M.LITTLE@larc.nasa.gov>,
>> > e.b.geier@larc.nasa.gov
>> >From: "Bruce A. Wielicki" <b.a.wielicki@nasa.gov>
>> >Subject: Friday 3-4pm, Rm161
>> >
>> >CERES WG Chairs:
>> >
>> >attached is Erika's stab at laying out a CERES processing schedule
>> >for the next several months. we need to have a clear picture of
>> >when we can deliver software, do the processing, and get the data
>> >products to the community. the DAAC needs a clear plan for when
>> >processing needs to be done, and new code needs to be tested.
>> >
>> >lets discuss this after the TISA meeting on friday, 3-4pm, Rm 161
>> >figure TISA 1-3pm and scheduling 3-4pm.
>> >
>> >if you cannot make it for any reason: you need to get me your input
>> >by friday morning so we can include it in the discussions of
>> >production schedules and priorities.
>> >
>> >invite whoever you think necessary from your working groups to be

>> >able to answer code delivery schedules, etc.
>> >
>> >cheers
>> >bruce
>> >
>> >
>> >
>> >>Date: Mon, 1 Aug 2005 12:21:00 -0400
>> >>To: Bruce Wielicki <b.a.wielicki@larc.nasa.gov>
>> >>From: Erika Geier <e.b.geier@larc.nasa.gov>
>> >>Subject: 1st cut at schedule
>> >>
>> >>  Bruce,
>> >>
>> >>Based on conversations last week, here is a first cut at the
>> >>production schedule.  I'll drop a hardcopy by shortly.
>> >>
>> >>Erika
>> >>

## Email 11.

Date: Fri, 02 Sep 2005 13:00:05 -0400
To: l.h.coleman@larc.nasa.gov, t.e.caldwell@larc.nasa.gov
From: Tonya Davenport <t.g.davenport@larc.nasa.gov>
Subject: CER5.1P1
Cc: l.g.link@larc.nasa.gov, s.e.sorlie@larc.nasa.gov, cereststt@larc.nasa.gov

Lisa/Tom,

This week in operations we ran into an interesting problem.  It appears
that CER5.1P1 will run without the mandatory HMPSAL and HMAER files but
fail at the end.  I have temporarily added input data checks into our
scripts to check for the data before submitting the job.  However, you may
want to include them in your code. Some of the other subsystems will not
generate the PCF if all of the inputs are not found. I have included email
from production.

>>>>The script for CER5.1P1 doesn't seem to look for any other mandatory
>>>>input files except for SSFB/SSFA.  We've had two instances where the
>>>>pre-processor (CER5.0P1) for the next month was not processed but we
>>>>continued to submit the hourlies for the next month.  Of course all of
>>>>the jobs failed because the mandatory input files were missing.  Since
>>>>these files are mandatory, can either SIT or the developer insert a
>>>>check for the HMPSAL and HMAER files and not let the job continue if

>>>>there are none?

## Email 12.

Date: Thu, 8 Sep 2005 12:27:58 -0400
To: l.h.coleman@larc.nasa.gov, Fred Rose <f.g.rose@larc.nasa.gov>
From: Tom Charlock <Thomas.P.Charlock@nasa.gov>
Subject: Re: CRS PreAquaEd1
Cc: Scott Zentz <s.m.zentz@larc.nasa.gov>,
Dave Rutan <D.A.rutan@larc.nasa.gov>

Fred and Lisa,

I am reviewing the state of PreAquaEd1 from home today.
It looks good so far...

Tom

At 2:20 PM -0400 9/7/05, l.h.coleman@larc.nasa.gov wrote:
>Fred,
>
>Are the "outside of SARB" changes only in the Aqua SSFs and not
>the Terra SSFs (i.e., regardless of version of software, the
>improvement to the Terra results is minimal)?
>
>Lisa
>
>On Sep 7,  2:22pm, Fred Rose wrote:
>>  Subject: Re: CRS PreAquaEd1
>>  Lisa,
>>  Am not sure the Aqua Crs can be considered set as yet. That's up to Tom!
>>  There are differences in the science of the code, Mostly in coastal
>>  areas and fixed to problems that were revealed since the delivery
>>of Terra Ed2.
>>
>>  I do not have an answer to if the new Aqua code should be used for
>>  processing more TERRA data. However it is my opinion that this
>>  New 'Aqua' code is more robust and will give better results.
>>  But some of the reasons for better result with AQUA over TERRA are
>>  due to changes in processing outside of SARB.
>>  The improved H20% in IGBP vector , and the cloud groups improved CRH maps
>>  in AQUA are two known examples.. As well as the new ADM's that you
>>  pointed out.
>>
>>
>>  l.h.coleman@larc.nasa.gov wrote:

>> >
>> > Fred and Tom,
>> >
>> > Glad to see we are almost there. The delivery date is set for
>>November 17.
>> > It won't do us any good to deliver until after Inversion has
>>delivered with
>> > the Aqua ADMs, and that is scheduled for late October or early November.
>> > Between now and then we have to concern ourselves with the IBM
>> > cluster, so having the science settled now helps tremendously.
>> >
>> > I do have a question driven by an opertional issue. We currently have
>> > the code that processes both Terra Edition2 and Aqua Beta 1 in operation.
>> > We have completed processing for all the months for which we have MATCH
>> > data. In the past with new deliveries we have been able to simply replace
>> > the operational code with updated versions. If we do not anticipate
>> > processing anymore Terra Edition2 data with the current code, then we can
>> > again simply replace. However, if more MATCH data is expected
>>then I presume
>> > we will process more Edition2 Terra data. They usually do not like to
>> > change the software in the middle of a dataset unless before and after
>> > results can be considered scientifically equivalent.
>> >
>> > Am I correct in assuming the before and after results are not
>>scientifically
>> > equivalent? I have seen email from Dave Fillmore about
>>generating the MATCH
>> > data, but I have no feel for whether or not to actually expect it for more
>> > Terra Edition2 processing. Does anyone have any more definitive
>>of an answer?
>> > If we need to keep the current code in operational form, we in
>>DMT land need
>> > to know two weeks prior to delivery because it has an impact on
>>operational
>> > scripts and documents (we have to assign a new PGE number which is not a
>> > difficult thing, but it is in lots of places and does take a while to
>> > test thoroughly to make sure all references are correct).
>> >
>> > If we had a crystal ball it would make this too easy of a
>>question and therefore
>> > be absolutely no fun.
>> >
>> > Lisa
>> >
>> > On Sep 7, 11:13am, Fred Rose wrote:
>> > > Subject: CRS PreAquaEd1

>> > > Tom,
>> > >
>> > > Scott ran a full day of aqua CRS (20030629) with the minor
>> > > modification of the COAST threshold to 20:99% Water
>> > > without snow or ice.
>> > >
>> > > http://srbsun.larc.nasa.gov/ceres/aqua/Cst_1-99_20-99.pdf
>> > > shows maps of TOA SW error of the (1:99%) and (20:99) logic
>> > > runs and maps and scatter plots of the resulting surface
>> > > albedo differences. It looks to have preformed as hoped!
>> > >
>> > > As for the delivery of Aqua Ed1,
>> > > I'm asking everyone, if I forgetting any changes??
>> > >  Here is a list and description of the changes from Ed2 Terra CRS
>> > >  wiht plots associated acessing some of the incremental changes.
> > > > >  http://srbsun.larc.nasa.gov/ceres/aqua/
>> > >
>> > > Hope we are near the end of the fine tuning  of the
>> > > Aqua CRS code so it can packaged up for daac delivery!?
>> > >
>> > > The Binary ,Validation Subset Binary and HDF versions of the
>>last run are on..
>> > > lightning:/CERES/sarb-1/zentz/sarb/data/out_comp/data/sarb
>> > > --
>> > > Fred G. Rose (757)827-4649
>> > > http://srbsun.larc.nasa.gov/~rose/
>> > > f.g.rose@larc.nasa.gov
>> > >-- End of excerpt from Fred Rose
>> >
>> > --
>> >

## Email 13.

Date: Mon, 19 Sep 2005 13:25:58 -0400 (EDT)
From: "Scott M. Zentz" <szentz@saisun18.larc.nasa.gov>
Reply-To: "Scott M. Zentz" <szentz@saisun18.larc.nasa.gov>
Subject: Weekly update
To: l.h.coleman@larc.nasa.gov

Lisa,

No update on S4P.

I have been able to compile and run both the 5.1 and 7.2 along with the smf

files. No comparison has been made with 7.2 yet. 5.1 has compared very favorably with the SGI run made by Tom back in June. 1700 records were mismatched with vast majority being simply precision differences. I shall pass the results onto Fred for closer analysis of the science results. One issue with SYN on manila is I get a weird error message in runlogs:

PGS_CBP_Earth_CB_Vector Error:Message...

This shows up for every record, I dont know yet whether this effects data but it does not seem to effect the flow of execution, meaning the program still runs to completion.

I have made a new run of SYN using a newly provided TSIB file from Cathy. Fred is looking at this now.

Will start pre-processor today or tomorrow. All in all a very smooth transition.

Scott

## Email 14.

--- Forwarded mail from Fred Rose <f.g.rose@larc.nasa.gov>

Date: Thu, 11 Aug 2005 10:26:12 -0400
From: Fred Rose <f.g.rose@larc.nasa.gov>
To: "Scott M. Zentz" <szentz@saisun18.larc.nasa.gov>
CC: l.h.coleman@larc.nasa.gov, Tom Charlock <Thomas.P.Charlock@nasa.gov>
Subject: Re: ASSALUT LUT file revision

Scott,
Thank you for your prompt running the Aqua CRS test.
It did improve the bias and rms !
http://srbsun.larc.nasa.gov/ceres/aqua/cont_to_sulf_aqua_cldcry.pdf

If we were in a rush to deliver by the end of the week I would say it’s ok , But discovered that I was using a different Spectral albedo file "Spectral_Dat.f90" than the most current one you have in Sarblib.
There were changes to 3 of IGBP Types used for creation of the ASSALUT table. The more recent ones have much less nearIR reflection for Snow and SeaIce.
Think this is a factor in the TOA Bias problem for Cloudy Cryosphere.
The current bias is still 1% using sulfate aersols down from 1.5% using continental.

( There is a clue to this in that the bias was dependent on precipitable
water, with the ASSALUT having a larger portion of the reflection in the NIR
as PW increased it had increased surface albedos to compensate for water vapor
absorption.
In the CRS calculation the smaller proportion of NIR reflection was not affected
so the TOA albedo was overestimated.
See http://srbsun.larc.nasa.gov/ceres/aqua/pre_cldycry_bias.pdf page 2 top left)

So...
Have started another ASSALUT creation run using the
updated Spectral_Dat.f90 file. It should be finished by about noon today Aug 11 2005

It will be named :
lightning:/CERES/sarb/home/rose/flsa200506/flsa200508c.fubin.tab
and will be 2419200 bytes

CAN YOU AGAIN replace the ASSALUT file and rerun the one hour (Overwrite of existing CRS file is OK)

--- *** ---

Here are the spectral shapes in the 15 fu sw bands just as reference.
Sea Ice Older version
/0.750,0.750,0.750,0.750,0.750,0.750,0.750,0.750,0.711,0.700,0.500,0.500,0.500,0.500,0.500/
Sea Ice Current SARBLIB
/0.778,0.778,0.778,0.778,0.778,0.778,0.778,0.778,0.778,0.752,0.393,0.055,0.054,0.036,0.036/

Permanent Snow Older version
/0.974,0.974,0.974,0.974
0.974,0.977,0.981,0.982,0.992,0.966,0.823,0.258,0.137,0.087,0.087/
Permanent Snow (Jin 1000um) Current SARBLIB
/0.910,0.910,0.910,0.916,0.921,0.931,0.947,0.964,0.953,0.920,0.635,0.013,0.006,0.009,0.014/

"Scott M. Zentz" wrote:
>
> Fred,
>
> The requested hour has been run using the supplied file. The new file is:
>
> /CERES/sarb-1/zentz/sarb/data/out_comp/data/sarb/CER_CRS_Aqua-FM3-MODIS_Edition1
> B_030034.2003062918
>
> The old file is:
>
> /CERES/sarb-1/zentz/sarb/data/out_comp/data/sarb/Old_CER_CRS_Aqua-FM3-MODIS_Edit

> ion1B_030034.2003062918
>
> The CRSB, CRSVB, and QC files all use the above convention, (Old_) in front of
> the filename, and can be found in the usual directories.  Just give me the word
> and I shall start the entire day run.
>
> Scott
>
> >Date: Wed, 10 Aug 2005 11:45:14 -0400
> >From: Fred Rose <f.g.rose@larc.nasa.gov>
> >X-Accept-Language: en
> >To: Scott Zentz <s.m.zentz@larc.nasa.gov>
> >CC: Tom Charlock <Thomas.P.Charlock@nasa.gov>
> >Subject: ASSALUT LUT file revision
> >MIME-Version: 1.0
> >Content-Transfer-Encoding: 7bit
> >
> >Scott
> >
> >
> >1)
> >Please replace the ASSALUT input file "flsa200506.fubin.tab"
> >
> >with the file...
> >
> >lightning:/CERES/sarb/home/rose/flsa200506/flsa200508.fubin.tab
> >
> > "flsa200508.fubin.tab" is identical in format and size and should be
> >directly interchangable. This file was created using sulfate aerosol
> >instead of continental. The lesser absorbing sulfate aerosol should have
> >the effect of reducing the retrieved surface albedos especially
> >for the highly reflective snow surfaces.
> >
> >I think this will probably  fix the problem for the most part.
> >
> >
> >
> >2)To test this please run the single CRS hour 2003062918
> >  Please DO NOT OVEWRITE the previous test at this point!!
> >
> >
> >
> >3) Expect to rerun the FULLDAY test (20030629) of 24 CRS soon after.
> >   For the full day test go ahead and overwrite the earlier full day test..
> >
> >

> >
> >Fred Rose wrote:
> >>
> >> Tom,
> >>  I may have found a reason for much of the SW TOA bias for
> >> Cloudy Cryosphere test. In  the model calculations to produce
> >> the ASSALUT LUT an aerosol optical depth of 0.1 (continental
> >> scale hgt 3km) was used across the board.
> >>
> >> >From looking at the MATCH climatology of constituent
> >> types in the Arctic the primary type is sulfate
> >> with some water soluble. The match mixture is
> >> likely less absorbing than the continental aerosol
> >> I used for the ASSALUT computations.
> >>
> >> Quick calculation with the online fu code confirm
> >> about a -0.008 toa albedo forcing for continental aerosol
> >> Tau=0.1 for a Cloudy Tau=10, fresh snow surface, CosSol=0.3
> >> where a SULFATE gives +0.001 aerosol forcing to toa albedo
> >>
> >> This forcing is also dependent on surface albedo
> >> ..more negative forcing for large sfc albedo...
> >>
> >> Will look in to this further tomorrow and
> >> possibly produce another LUT with less absorbing
> >> aerosol.
> >>
> >> Fred Rose wrote:
> >> >
> >> > Tom,
> >> > Scott ran 24hr of CRS Pre ED1 at the SCF overnight
> >> >
> >> > Placed Scatter plots looking at Differences in TOA flux Untuned and Tuned
> >> > http://srbsun.larc.nasa.gov/ceres/aqua/
> >> > http://srbsun.larc.nasa.gov/ceres/aqua/beta_aqua_20030629.pdf
> >> > http://srbsun.larc.nasa.gov/ceres/aqua/pre_aqua_20030629.pdf
> >> >
> >> > The changes since Beta Aqua have overall improved
> >> >  the SW RMS, with a slightly worse SW TOA bias.
> >> > Clear and Cloudy Sky coast showed good RMS improvement, with
> >> > very minor bias change!
> >> >
> >> > However am a little disapointed with the results for
> >> > Cloudy Sky Cryosphere.. Will look at this some more
> >> > to see what I can find. My guess right now is that
> >> > out of range retrievals sfcalb >1 or sfcalb < 0

> >> > being assigned sfcalb =1.0 or sfcalb=0 are probably to blame
> >> > If so, maybe the thing to do is call them
> >> > default_snow and default_ocean for these cases.
> >> > as long as the ASSALUT routine is found to be working properly.
> >> >
> >> >
> >> >
> >> > Tom Charlock wrote:
> >> > >
> >> > > Fred,
> >> > >
> >> > > An advance for integrity, I hope.
> >> > >
> >> > > Please compare the surface albedos for
> >> > > 1. everything
> >> > > 2. cloudy coast
> >> > > 3. clear coast
> >> > > 4. cloudy snow
> >> > > 5. clear snow
> >> > > just to be sure we understand what's happening.
> >> > > I'd suggest a look at tuned TOA fluxes vs obs
> >> > > (BETA and PRE ED1) for coast and snow, too.
> >> > >
> >> > > If you're sure that the changed logic has not affected
> >> > > AOT, aerosol constituencies, skin temperature over
> >> > > coasts, let me know.  If not, try some way of looking
> >> > > at the differences between BETA and PRE ED1.
> >> > >
> >> > > Thank you,
> >> > >
> >> > > Tom
> >> > >
> >> > > At 1:00 PM -0400 8/8/05, Fred Rose wrote:
> >> > > >Tom,
> >> > > >
> >> > > >Here are a few simple scatter plots of one hour of :
> >> > > >
> >> > > >Beta1 AQUA CRS ( daytime only pg1 , coast only pg2)
> >> > > >Pre ED1 AQUA CRS ( daytime only pg3 , coast only pg4)
> >> > > >
> >> > > >The RMS error tightens up , but the bias gets
> >> > > >slightly worse. But this is just one hour..
> >> > > >
> >> > > >I've asked Scott to proceed to running a full day at the
> >> > > >SCF over the next day or two.
> >> > > >

> >> > > >
> >> > > >Again  Walt Miller has included the H2O% map in convolution
> >> > > >so this is then the list of code changes for
> >> > > >Aqua Beta to Aqua Ed1 as of Aug 8th 2005.
> >> > > >
> >> > > >http://srbsun.larc.nasa.gov/ceres/aqua/
> >> > > >
> >> > >
>
>==========
> ==========
> >> > > >List of Post CrsEd2B code changes::
> >> > > >
> >> > > >
> >> > > >1)Fix of Surface albedo retrieval when Match AOT < 0.0001
> >> > > >        Due to a division by zero bug in the aerosol SSA
> >> > > >        computation needed for Surface Albedo retrieval. A small
> percentage
> >> > > >        of FOVS were not getting valid clear sky surface albedos.
> >> > > >
> >> > > >        Extent of Problem:
> >> > > >        For the 4 years of match data....
> >> > > >        13.5%   of days out of 4years have an instance with AOD <
> 0.0001
> >> > > >        3.874%  is MAX percentage of earth that has AOD < 0.0001
> >> > > >occured on 20030301
> >> > > >        0.70%   mean % of the earth that is affected on days that
> >> > > >have an instance with AOD<0.0001
> >> > > >        0.095%  Area_Time percentage of earth over 4years of  AOD <
> 0.0001
> >> > > >        Also this I for the Entire grid "the bug" would have only
> affected the
> >> > > >        sunlit portion of the earth.
> >> > > >
> >> > > >
> >> > > >2)Change in surface albedo logic for Cloudy Sky Coast.
> >> > > >        Revised to use SAH cloudy land albedo value only for "ocean <
> 1%".
> >> > > >        In Ed2B, if any land was in FOV a land SAH value was used.
> >> > > >        This led to a unrealistically large surface albedo.
> >> > > >        Now a COAST logic has been added weighting Z.Jin Ocean and
> >> > > >        IGBP default surface albedos.
> >> > > >
> >> > > >3)Change in surface albedo logic for Clear  Sky Coast.
> >> > > >         Change  logic for surface albedo retrievals that were less

> than zero.
> >> > > > In some instances, especially for low wind speed coastal fovs,
> >> > > > the CERES toa albedo could be less than a Model
> >> > > > Changed to use Z.Jin ocean LUT value, In Ed2B cloudy SAH
> surface
> >> > > > albedos were the alternative.
> >> > > >
> >> > > > >4)Change in Cloudy Sky Surface ALbedo retrieval over snow.(ASSALUT)
> >> > > > Update Cloudy Sky surface albedo of snow and ice FOVs
> >> > > > more complex LUT now explicitly includes
> >> > > > {TOA_ALBEDO,CloudFracton(s),CloudHeight(s),sCloudTau(s),
> >> > > > CloudParticleSize(s), CosSol, PW,O3,SfcElev}
> >> > > > In Ed2B on {TOA_ALBEDO, Optical Depth weighted cloud
> >> > > > >fraction , CosSol } were used
> >> > > > >
> >> > > > >5)Change in spectral shape in UV region.
> >> > > > Dave Rutan and Wenying Su furnished revised tabular values
> >> > > > >of spectral surface albedo
> >> > > > to revise the SARBLIB file Spectral_Dat.f90 for these IGBP
> types.
> >> > > > ( 6) CLOSED SHRUBS
> >> > > > ( 8) WOODY SAVANNA
> >> > > > ( 9) SAVANNA
> >> > > > (10) GRASSLAND
> >> > > > (12) CROPLAND
> >> > > > (14) CROP MOSAIC
> >> > > > (18) TUNDRA
> >> > > > >
> >> > > > >6)Fix of Ice Cloud direct diffuse. ( cerfu20050726)
> >> > > > The Fu95 IceCloud treatment changed the definiton of the direct
> >> > > > beam to better handle the ice cloud forward scattering peak
> >> > > > >for the 2-stream solver.
> >> > > > Additional code was inserted to "save" the true direct beam
> >> > > > >at the surface
> >> > > > for output. Care must be used to usefsfc(1:4)%dirsfc and
> >> > > > >fsfc(1:4)%difsfc,
> >> > > > for surface direct and diffuse.other output arrays may contain
> the
> >> > > > ’alternate definition’ fu used.
> >> > > > >
> >> > > > >7)Change in definition of PAR. ( cerfu20050726)
> >> > > > Wenying Su furnished spectral weighting factors from which a
> >> > > > >LUT was included
> >> > > > in the Fu code to take the spectral band 7-10 (
> >> > > > >357.5-689.6nm) output and
> >> > > > convert to (400-700nm) and "Purves action spectra" PAR

> >> > > >
> >> > > >--
> >> > > >Fred G. Rose (757)827-4649
> >> > > >http://srbsun.larc.nasa.gov/~rose/
> >> > > >f.g.rose@larc.nasa.gov
> >> > > >
> >> > > >
> >> > > >Attachment converted: Macintosh HD:pre_ed1_aqua_hr.pdf (PDF /CARO)
> (002541D9)
> >> > > >
> >> > > --
--
Fred G. Rose (757)827-4649
http://srbsun.larc.nasa.gov/~rose/
f.g.rose@larc.nasa.gov

## Email 15.

Date: Fri, 12 Aug 2005 11:07:07 -0400 (EDT)
From: "Scott M. Zentz" <szentz@saisun18.larc.nasa.gov>
Reply-To: "Scott M. Zentz" <szentz@saisun18.larc.nasa.gov>
Subject: Re: ASSALUT out of rangelogic & CRH patch
To: f.g.rose@larc.nasa.gov
Cc: l.h.coleman@larc.nasa.gov

Fred,

The changes have been made and the runs started.  You should see some results in a few hours.

Scott

>Date: Fri, 12 Aug 2005 10:58:50 -0400
>From: Fred Rose <f.g.rose@larc.nasa.gov>
>X-Accept-Language: en
>MIME-Version: 1.0
>To: "Scott M. Zentz" <szentz@saisun18.larc.nasa.gov>
>CC: Tom Charlock <Thomas.P.Charlock@nasa.gov>
>Subject: ASSALUT out of rangelogic & CRH patch
>Content-Transfer-Encoding: 7bit
>
>Scott,
>Made some hopefully minor changes to the Cloudy Sky Snow logic to accomplish three things.
>

>1) Treat Out of range Negative surface albedo retrievals as OCEAN
> for surface albedo.
>
>2) Treat Out of range Positive surface albedo retrievals as FRESH SNOW
> for surface albedo. These out of range retrievals occur at large
> cloud optical depth where the sensitivity of the TOA albedo to surface
> albedo is small.
>
>3) Hardwire a fix to force the surface albedo to ALWAYS be treated as SEAICE
> north of 85N . This is because of a known problem with the Cloud Groups
> Clear Radiance History(CRH) map. The Orbit of TERRA and AQUA only allow
> large view zenith looks at this latitude. At large VZA there is almost
> always cloud so the CRH map never gets updated.
>
>
>
>/CERES/sarb/home/rose/specsfc/Spectral_Sfc_200508.f90
>
>Has the revised logic I want to try for CRS AQUA
>
>gdiff /CERES/sarb-1/zentz/sarb/lib/src/Spectral_Sfc.f90
/CERES/sarb/home/rose/specsfc/Spectral_Sfc_200508.f90
>
>If you could start a full day test once this is integrated in the code,
>overwriting the last run is OK

## Email 16.

Date: Thu, 7 Oct 2004 13:51:47 -0400 (EDT)
From: "Scott M. Zentz" <szentz@saisun18.larc.nasa.gov>
Reply-To: "Scott M. Zentz" <szentz@saisun18.larc.nasa.gov>
Subject: Beta QC
To: t.e.caldwell@larc.nasa.gov, l.h.coleman@larc.nasa.gov

All.

Here is an example of the new QC I have been working on. This includes all of the suggestions and requests from Fred and Dr. Charlock up to this point. Some things I am not sure about are parameter names, I tried to limit myself to 10 characters but for some parameters like, "Modis view zenith angle between 31 and 60" it is pretty tough to express in 10 characters and there are others like that. So if you guys ever take a look at this see if stuff understandable and legible, also if you think of anything that would also be convienant to have please let me know.

I am going to hold off on updating 5.4 and the corresponding IDL code that reads

QC files until Fred and Tom Charlock are satisfied and no more updates are imminent. I did briefly look over it and doesnt appear to need many changes.

Go here to view:
/CERES/sarb/zentz/sarb/data/out_comp/qa_reports/sarbsyn/CER_KQCR_Terra-FM1-MODIS_SSIT_999999.200107Z180

Scott

## Email 17.

Date: Wed, 8 Jun 2005 12:01:38 -0400 (EDT)
From: "Scott M. Zentz" <szentz@saisun18.larc.nasa.gov>
Reply-To: "Scott M. Zentz" <szentz@saisun18.larc.nasa.gov>
Subject: 200107 complete 5.1 run
To: f.g.rose@larc.nasa.gov
Cc: d.a.rutan@larc.nasa.gov, l.h.coleman@larc.nasa.gov,
Thomas.P.Charlock@nasa.gov

Fred,

I have completed the requested run of 200107 with the 2 changes,

1) Change in definition of coast to eliminate SAH (land) surface
albedo being used. Instead a FOV IGBP percentage weighting of
Z.JIN OCEAN LUT and IGBP default land surface albedos will be used.
this was tested earlier for a portion of one hour over cove.
2) Fix Zero divide in computation of FOV mean Aerosol SSA which caused a no
surface albedo retrieval in polar areas where match AOT < 0.001.

This run used Edition2B CRSVB files as input instead of the usual SSFB files.

Output can be found here, files will contain "Subset" as Prod Strategy:

New CRSVB files are here: /CERES/sarb-c/zentz/CRSs/CRSVB

New CRSV files are here: /CERES/sarb-c/zentz/CRSs/CRSV

New QC files are here : /CERES/sarb-c/zentz/CRSs/QC

Enjoy,

Scott

## Email 18.

Date: Fri, 22 Apr 2005 10:05:00 -0400 (EDT)
From: "Scott M. Zentz" <szentz@saisun18.larc.nasa.gov>
Reply-To: "Scott M. Zentz" <szentz@saisun18.larc.nasa.gov>
Subject: 5.4 upgrade
To: l.h.coleman@larc.nasa.gov

Lisa,

As you probably inferred from my early email about the CVS updates, I have completed the 5.4 update to handle the new QC params as requested by Fred. Should I just pick another task from that Requirements list you sent out recently or did you have anything else in mind?

Scott

## Email 19.

Date: Mon, 23 May 2005 11:54:27 -0400 (EDT)
From: "Scott M. Zentz" <szentz@saisun18.larc.nasa.gov>
Reply-To: "Scott M. Zentz" <szentz@saisun18.larc.nasa.gov>
Subject: Re: (Fwd) Re: A request to test modified cloudy sky coastal surface albedo in CRS
To: l.h.coleman@larc.nasa.gov

Lisa,

Output from that run can be found here:
/CERES/sarb/zentz/sarb/data/out_comp/data/sarb

Files are:
CER_CRS_Terra-FM1-MODIS_Edition2B_018024.2001071916
CER_CRS_Terra-FM1-MODIS_Edition2B_018024.2001071916.met
CER_CRSB_Terra-FM1-MODIS_Edition2B_018024.2001071916
CER_CRSB_Terra-FM1-MODIS_Edition2B_018024.2001071916.met
CER_CRSVB_Terra-FM1-MODIS_Edition2B_018024.2001071916
CER_CRSVB_Terra-FM1-MODIS_Edition2B_018024.2001071916.met

Scott

>From: l.h.coleman@larc.nasa.gov
>Date: Mon, 23 May 2005 11:27:01 -0400
>To: s.m.zentz@larc.nasa.gov
>Subject: (Fwd) Re: A request to test modified cloudy sky coastal surface albedo

in CRS
>MIME-Version: 1.0
>
>Scott,
>
>I have been updating the SARB AI list for Aqua Beta2, which includes this
>test.  Can you tell me the name of the CRS output file this created?
>
>Lisa
>
>
>--- Forwarded mail from Fred Rose <f.g.rose@larc.nasa.gov>
>
>Date: Mon, 23 May 2005 08:51:04 -0400
>From: Fred Rose <f.g.rose@larc.nasa.gov>
>To: Scott Zentz <s.m.zentz@larc.nasa.gov>,
>       Lisa Coleman <L.H.Coleman@larc.nasa.gov>,
>       Tom Charlock <Thomas.P.Charlock@nasa.gov>,
>       Dave Rutan <D.A.rutan@larc.nasa.gov>,
>       Zhonghai Jin <z.jin@larc.nasa.gov>
>Subject: Re: A request to test modified cloudy sky coastal surface albedo in
CRS
>
>All
>Scott implemented and ran a test case of
>the "Coastal Surface Albedo fix" Dave Rutan and I came up with.
>The results look better as one would hope.
>
>See attached pdf of coastal fovs during CLAMS on 2001071916
>Page 1) Original ED2B
>Page 2) Implementing "Coastal Surface Albedo fix"
>
>Upper left ( surface albedo)
> Lower sfcalb  near coast and up Chesapeake bay result.
>
>Upper Right ( CRS_UT- Obs TOA SW)
>Bias and RMS improvement
>
>Lower Right ( sfc Alb vs Ocean %)
>With the fix, surface albedo  now correlated with
>Ocean %, as one would expect.
>
>
>Page 3) Reference plots of
> Ln(cloud Tau)
> Ocean %

> View Zenith angle.
>
>Fred Rose wrote:
>>
>> Scott,
>>
>>  One issue that we have with our current CRS ED2B runs is
>> the Cloudy Surface Albedo for "Coastal" Fovs.
>> Currently we pull a land Surface albedo from history map(SAH),
>> if the FOV falls within a SAH land grid box(10minute).
>> This can give a large overestimate of surface albedo if the FOV is
>> Coastal(1%< ocean%  <99% .and no ice or snow) but primarily ocean.
>> One of our primary validation sites COVE, falls in one of these SAH
>> grid boxes, so for cloudy sky COVE gets a land surface albedo.
>> For conditions of thin cloud this gives us problems in matching TOA
>> observed SW Flux.
>>
>>  To try and solve this have made some UNCOMPILED and UNTESTED changes
to
>> one of the MODULES in SARBLIB "/CERES/sarb/lib/src/Spectral_Sfc.f90"
>> the modifications are fairly minor just dealing with a simple change to
introduce
>> logic for a coastal condition and to call the Z.Jin ocean albedo routine for
>> the part of the FOV that is Ocean, where the IGBP based surface albedo
averaging
>occurs.
>> Before only a crude spectral ocean albedo was used in this part of the code.
>>
>> The modified module is
>> /CERES/sarb/home/rose/specsfc/Spectral_Sfc_200505.f90
>>
>> gdiff /CERES/sarb/home/rose/specsfc/Spectral_Sfc_200505.f90
>/CERES/sarb/lib/src/Spectral_Sfc.f90
>>
>> Could you produce a test run by
>>
>> 1) Swap the module  "Spectral_Sfc_200505.f90"  for the existing
Spectral_Sfc.f90
>> 2) See if it compiles in the SARB environment, if not let me know....
>>
>> 3) Make a run for the first 1000 fovs of
>CER_CRSB_Terra-FM1-MODIS_Edition2B_018024.2001071916
>>  and tell me the location of the output file so I can see if it works.
>>
>> These 1000 FOV’s fall over COVE during CLAMS on a day that has considerable
thin cloud

>> A time and location where this problem is near its worst.
>>
>> --
>> Fred G. Rose (757)827-4649
>> http://srbsun.larc.nasa.gov/~rose/
>> f.g.rose@larc.nasa.gov
>

## Email 20.

Date: Tue, 24 May 2005 06:46:55 -0400
From: David Rutan <d.a.rutan@larc.nasa.gov>
To: l.h.coleman@larc.nasa.gov
CC: FredR <f.g.rose@larc.nasa.gov>
Subject: Re: North Pole

Lisa,

Sounds about right to me. Originally we considered using all SSF's for global SAH's. Then in the end decided that CRSVB would do the job just as well, as far as testing is concerned.

.....Dave

l.h.coleman@larc.nasa.gov wrote:
>
> Fred and Dave,
>
> Here is a summary (my version) of the discussion we had today at 12:30.
>
> Evaluation of the Terra Edition2B CRS indicates errors in the surface albedo retrievals
> for coastal FOVs with cloudy sky conditions.  This can be traced to the gridded Surface
> Albedo History (SAH) map.  Fred plans to provide a possible solution this week that will
> write more SSF-based surface albedo data for arctic regions to the SAH.  Since sufficient
> testing will require multiple months of data and a number of the affected FOVs happen to
> coincide with CERES validation regions, the CRSVB product is a good choice for the
> primary input data source.
> We may also choose to generate the test SAH map using Fred's fix with the CRSVB files.
>
> The DMT group needs to verify that the SARB software can run with a CRSVB as input.  If
> not, we need to determine what we need to do to make the software work using the CRSVB as
> input and then decide whether or not to pursue it.

>
> Did I get this right?
>
> Lisa
>
> On May 23, 11:50am, David Rutan wrote:
> > Subject: North Pole
> > All,
> >
> > The north pole is in fact a validation region. It’s called
> > the "Northern Hemisphere summer sea ice" region. There is
> > a second at 78N,50E called the Northern hemisphere seasonal
> > sea ice" region.
> >
> > .....David
> >
> >

## Email 21.

Date: Fri, 22 Apr 2005 10:05:00 -0400 (EDT)
From: "Scott M. Zentz" <szentz@saisun18.larc.nasa.gov>
Reply-To: "Scott M. Zentz" <szentz@saisun18.larc.nasa.gov>
Subject: 5.4 upgrade
To: l.h.coleman@larc.nasa.gov

Lisa,

As you probably inferred from my early email about the CVS updates, I have completed the 5.4 update to handle the new QC params as requested by Fred. Should I just pick another task from that Requirements list you sent out recently or did you have anything else in mind?

Scott

## Email 22.

Date: Thu, 21 Apr 2005 16:42:56 -0400 (EDT)
From: "Scott M. Zentz" <szentz@saisun18.larc.nasa.gov>
Reply-To: "Scott M. Zentz" <szentz@saisun18.larc.nasa.gov>
Subject: cvs update for 5.4
To: t.e.caldwell@larc.nasa.gov
Cc: l.h.coleman@larc.nasa.gov

Tom,

I updated CVS with a new Single_QC_Read.f90 and SARB_MonQC_Params.f90. Also run_postss5_mqc.

Scott

## Email 23.

Date: Fri, 22 Apr 2005 14:07:27 -0400 (EDT)
From: "Scott M. Zentz" <szentz@saisun18.larc.nasa.gov>
Reply-To: "Scott M. Zentz" <szentz@saisun18.larc.nasa.gov>
Subject: new cvs updates
To: t.e.caldwell@larc.nasa.gov
Cc: l.h.coleman@larc.nasa.gov

Tom,

New version of InstSARB_QCplot.pro InstSARB_QCplot.dat are now in CVS.

Scott

## Email 24.

Date: Wed, 11 May 2005 15:41:58 -0400
From: Fred Rose <f.g.rose@larc.nasa.gov>
To: Tom Charlock <Thomas.P.Charlock@nasa.gov>,
"T.E Caldwell" <T.E.CALDWELL@larc.nasa.gov>,
Lisa Coleman <L.H.Coleman@larc.nasa.gov>,
Dave Rutan <D.A.rutan@larc.nasa.gov>,
Zhonghai Jin <z.jin@larc.nasa.gov>
CC: Scott Zentz <s.m.zentz@larc.nasa.gov>, J.L.Donaldson@larc.nasa.gov
Subject: CRS ED2B Clear Snow&Ice Surface Albedo Issue

All,

Scott Zentz and I tracked down the problem of incorrect snow&ice surface albedo. It began creation of NaN for the input of an aerosol optical depth weighted (1.0-SSA) "wssa" to the TOA based surface albedo retrieval algorithm.

"wssa" is used to account for aerosol absorption in the lookup of surface albedo based on TOA albedo.

For FOV's where the aerosol optical depth is < 0.0001 truncation error resulted in a division by zero for the creation of

variable "wssa"

The NaN value of "wssa" input to the TOA based surface albedo retrieval algorithm
resulting in a NaN as the output of the surface albedo retrieval

This BAD RETRIEVAL was caught and the Surface Albedo History map was called
but the SAH map only updates over land  therefor the IGBP DEFAULT surface albedo
for the latitude/longitude is used.
For SEAICE(igbp=20) where the default IGBP type is OCEAN
so a ocean surface albedo was used.
For FRESHSNOW(igbp=19) the underlaying IGBP Land surface albedo was used.
For PERMANENT SNOW(igbp=15) the Default Snow albedo was used so the error
was likely small.

The occurance of <0.0001 Aerosol optical depth is infrequent and typically
is found in Match data at high latitude transitioning out of polar night.

The fix was simple.
Set "WSSA" to 0.0  if the Aerosol optical depth is 0.0

In wssacomp.f90

CHANGED:
```
 getwssa=getwssa/saot
```
CHANGEDTO:
```
 if ( saot == 0 ) then
  getwssa=0.0
 else
  getwssa=getwssa/saot
 endif
```
ENDCHANGES:

This was tested on the ~180 FOV's that were showing the large negative Untuned error.
The mean error for these Fov's which was < -100 wm2 is now only < 2Wm2

Scott is now going to run the full CRS hour of 2003030317

Thankfully tuning corrects much of the UNTUNED surface albedo error!

Also Jim Donaldson's conversion of the Sarb Algorithm  MAY HAVE (??)
already caught this problem but this was after the ED2B CRS Delivery.

--
Fred G. Rose (757)827-4649
http://srbsun.larc.nasa.gov/~rose/

f.g.rose@larc.nasa.gov

## Email 25.

Date: Wed, 28 Sep 2005 15:40:52 -0400
To: Fred Rose <f.g.rose@larc.nasa.gov>, Wenying Su <w.su@larc.nasa.gov>,
Scott Zentz <s.m.zentz@larc.nasa.gov>,
Lisa Coleman <L.H.Coleman@larc.nasa.gov>
From: Tom Charlock <Thomas.P.Charlock@nasa.gov>
Subject: Terra , Aqua PAR wavelengths Re: PAR Validation
Cc: David Rutan <d.a.rutan@larc.nasa.gov>

Fred,

Thank you for this report.  Please follow Wenying's suggestion to use PAR as 400:700.  If Scott can make this change for Aqua Edition without too much effort, we'd deliver a better product.  There were questions about  CRS PAR from U. Maryland this week.  Yes, we would REPLACE the current PAR, as you write.  The old "PAR" of Aqua would have its last hurrah on Terra Edition 2B.

What we have now:
Terra Edition 2B  PAR=Fu-Liou(8:10)
Aqua Beta1  PAR= Fu-Liou(8:10)

What have planned:
SYN PAR=400:700 (for Terra, Aqua, GEO and any interpolated data bases)

What we now should change to:
Aqua Edition PAR=400:700
If this last move is too cumbersome, let me know.  It's not critical.

What we now plan for Edition 3:
PAR=400:700 all around

Who's mistakes we should all watch out for:
Tom

At 3:13 PM -0400 9/28/05, Fred Rose wrote:
>Tom,Wenying
>As suspected the output of PAR in the 'AQUA' CRS remains
>as fu bands(8:10). The additions of (400:700 PAR) and (PURVES PAR)
>were made for the upcoming SYN code.
>
>Scott reported me that no change was directly

>requested to the PAR output variable in CRS.
>
>I think there was confusion on
>and if this was for SYN alone or SYN and CRS.
>and  which new  variable to use.
>
>Also this would require a change in the documentation
>of CRS outputs. I assume we would want to REPLACE
>the current PAR , NOT add parameters to the CRS.
>
>
>IF YOU WANT TO REPLACE PAR ON CRS  WITH A NEW DEFINITION,
>which one would it be.
>
>A) 400:700 PAR
>B) PURVES PAR
>
>
>
>Tom Charlock wrote:
>>
>>  David,
>>
>>  I think you can show something like this.  Congradulations
>>  on being agile.
>>
>>  Fred is going to check, and see if the "Pre Edition" Aqua will
>>  run with the "right" PAR.
>>
>>  Tom
>>
>>  Your comparisons could refer to .  At 1:58 PM -0400 9/28/05, David
>>Rutan wrote:
>>  >Tom,
>>  >
>>  >    Attached is a first look at PAR comparisons made
>>  >between CRS results and SURFRAD observations. Though
>>  >we know it (PAR on CRS) is wrong the first idea here is
>>  >to find out how wrong and show that perhaps it is not
>>  >that bad. The second idea is would it be okay to advertise
>>  >a "corrected" PAR at the iLEAPS meeting, with the caveat
>>  >that appropriate corrections are coming in the next
>>  >version?
>>  >
>>  >   The basic outline is a direct comparison first, then
>>  >a simple correction based on difference in spectrum observed

>> >by the SURFRAD instruments compared to Fu bands. (Using
>> >Zhonghai's model to calculate the incoming SW flux under
>> >a SINGLE condition.) Then applying the correction and
>> >looking at it again.  (Remaing plots are ancillary just
>> >looking for relationships.)
>> >
>> >  It's rudimentary and I know Wenying has made changes to
>> >address it in a more detailed manner. But it certainly
>> >looks as if the major contributor to the difference is
>> >the mismatch in wavelength.
>> >
>> >  Would you feel comfortable if we showed something like
>> >this or is there too much hand-waving?
>> >
>> >.....David

## Email 26.

Date: Thu, 7 Oct 2004 13:51:47 -0400 (EDT)
From: "Scott M. Zentz" <szentz@saisun18.larc.nasa.gov>
Reply-To: "Scott M. Zentz" <szentz@saisun18.larc.nasa.gov>
Subject: Beta QC
To: t.e.caldwell@larc.nasa.gov, l.h.coleman@larc.nasa.gov

All.

Here is an example of the new QC I have been working on.  This includes all of the suggestions and requests from Fred and Dr. Charlock up to this point.  Some things I am not sure about are parameter names, I tried to limit myself to 10 characters but for some parameters like, "Modis view zenith angle between 31 and 60" it is pretty tough to express in 10 characters and there are others like that.  So if you guys ever take a look at this see if stuff understandable and legible, also if you think  of anything that would also be convienant to have please let me know.

I am going to hold off on updating 5.4 and the corresponding IDL code that reads QC files until Fred and Tom Charlock are satisfied and no more updates are imminent.  I did briefly look over it and doesnt appear to need many changes.

Go here to view:
/CERES/sarb/zentz/sarb/data/out_comp/qa_reports/sarbsyn/CER_KQCR_Terra-FM1-MODIS_SSIT_999999.200107Z180

Scott

## Email 27.

Date: Wed, 8 Jun 2005 12:01:38 -0400 (EDT)
From: "Scott M. Zentz" <szentz@saisun18.larc.nasa.gov>
Reply-To: "Scott M. Zentz" <szentz@saisun18.larc.nasa.gov>
Subject: 200107 complete 5.1 run
To: f.g.rose@larc.nasa.gov
Cc: d.a.rutan@larc.nasa.gov, l.h.coleman@larc.nasa.gov,
Thomas.P.Charlock@nasa.gov

Fred,

I have completed the requested run of 200107 with the 2 changes,

1) Change in definition of coast to eliminate SAH (land) surface
albedo being used. Instead a FOV IGBP percentage weighting of
Z.JIN OCEAN LUT and IGBP default land surface albedos will be used.
this was tested earlier for a portion of one hour over cove.
2) Fix Zero divide in computation of FOV mean Aerosol SSA which caused a no
surface albedo retrieval in polar areas where match AOT < 0.001.

This run used Edition2B CRSVB files as input instead of the usual SSFB files.

Output can be found here, files will contain "Subset" as Prod Strategy:

New CRSVB files are here: /CERES/sarb-c/zentz/CRSs/CRSVB

New CRSV files are here: /CERES/sarb-c/zentz/CRSs/CRSV

New QC files are here : /CERES/sarb-c/zentz/CRSs/QC

Enjoy,

Scott

## Email 28.

Date: Mon, 03 Oct 2005 08:56:39 -0400
From: Fred Rose <f.g.rose@larc.nasa.gov>
To: l.h.coleman@larc.nasa.gov
Subject: Re: Confirming - QC reports for Aqua Ed2B Delivery

Lisa,
Yes I’m , basicly happy with the new QC report format.
Was most interested to see the accounting of non-computable

FOVs and GridHrboxes up dated so we know what happened to
ALL records..

The addition of all the other subsets was a request from Tom.
I found the additional subset output a bit excessive,
but there may be instances when it becomes useful.

l.h.coleman@LaRC.NASA.GOV wrote:
>
> Fred,
>
> I am just seeking confirmation that the updates Scott made
> to the QC report last spring (?) are what you wanted. Do
> we need any other modifications to the Instantaneous SARB
> QC reports before we deliver (that you know of at this point)?
>
> Thanks,
> Lisa

# Email 29.

Date: Fri, 23 Sep 2005 08:43:26 -0400
From: Fred Rose <f.g.rose@larc.nasa.gov>
To: l.h.coleman@larc.nasa.gov
Subject: Re: SCCR for the Aqua CRS Edition2B Dataset

Lisa,
Here's my version of your list including my 8) and 9) under 4) as "a" and "b" . But
they could be dropped
for simplicity, as ASSALUT is essentialy a "new" item that was fine tuned using these
tests during the last month...
Note that Tom Charlock still wants a few more tests using TERRA data in this code before
delivery. I'm not sure you got an email on that?

==========
==========

Description of Change: (Science)
Delivery for Aqua Edition2A CRS dataset:
1.Correct the surface albedo retrieval for instances of MATCH values less than 0.0001.
2. Modify definition of surface albedo over cloudy coast to use the SAH cloudy land
albedo value for ocean coverage of less than 1%.
3. Modify definition of surface albedo over clear sky coast to use Z. Jin's ocean LUT
value.
4. Modify cloudy sky over snow surface albedo retrieval to include a more complex LUT
(ASSALUT).
a) Use Sulfate AOT for retrieval model

b) Assume OCEAN sfcalb for out of range low retrieval,
Assume SNOW for out of range high retrieval
5. Modify the spectral shape in the UV region.
6. Correct the direct/diffuse definition for ice clouds.
7. Modify the definition of PAR to include Wenying Su's spectral weighting factors.
8. Include time varying trace gas concentrations for CO2, CH4, N2O
9. Alter water percentage thresholds to 20:99% to be treated as Coast for surface albedo logic.

Reasons for Change: (Science)
1. Correcting potential for a division by zero.
2. Correcting unrealistically large surface albedo values for cloudy-sky coastal FOVs.
3. Correcting the resulting modeled TOA albedo that was larger than the CERES value for clear sky coast.
4. Accounting for the influence of more available input parameters.
5. Revised values for the closed shrubs, woody savanna, savanna, grassland, cropland, crop mosaic, and tundra IGBP scene types.
6. Improved handling of the ice cloud forward scattering peak for the 2-stream solver.
7. New weighting factors that convert the spectral band 7-10 (557.5-689.6nm) output to 400-700nm.
8. Account for increase in trace gas increases that have been observed.
9. Mostly land (1:20%) fovs are better served by using the Surface Albedo History (SAH) Map
than using a water percent weighted IGBP default surface albedos.

So, Fred, can you offically confirm that:
1. These changes are indeed intended for the Aqua Edition2B CRS dataset
---> These are all that I have
2. The changes and reasons for the changes are worded correctly and will stand the test of time when we have questions about them 5 years from now.
---> Who knows what will stand the tests of time ?
3. The changes have been implemented properly
-->All evidence I've lookes at in the series of test made over the last month or so
show these changes to be implemented correctly.

Hovever!! We still want to run tests of this "AQUA" code on TERRA data.

Tom Charlock strongly recomends..
1. A global day of the new Aqua software driving Terra SSF

2. A validation subset month of Aqua software driving Terra SSF

Fred G. Rose (757)827-4649

http://srbsun.larc.nasa.gov/~rose/
f.g.rose@larc.nasa.gov

## Email 30.

Date: Thu, 22 Sep 2005 11:39:39 -0400
From: Fred Rose <f.g.rose@larc.nasa.gov>
To: Tom Charlock <Thomas.P.Charlock@nasa.gov>
CC: "Scott M. Zentz" <szentz@saisun18.larc.nasa.gov>,
t.e.caldwell@larc.nasa.gov, Lisa Coleman <L.H.Coleman@larc.nasa.gov>
Subject: Re: Mac vs. SGI CRS

Tom,
One of the tasks that data management have is the conversion
of the CRS code to run on different machine architecture for future
processing. There are some differences related to machine precision
and compilers that we believe are primarily due to the fuliou
matrix solvers and/or tuning when derivitaves are small.
Sarb DMT ran one CRS on different machines and here's what we got.

SGI  93317 Valid Records
MAC  93326 Valid Records
SGI&MAC 93309 Common Valid Records

Resulting in 17 Records that are the union set of invalid FOVS.
This gives 17 / 93309 = 0.02%  difference in FOV rejection rate.
Compared to the typical FOV rejection rate for CRS Model of
around  0.1% of Total FOVS
So 0.02% difference is even small compared to even the
typical CRS FOV rejection percentage.

SGI:

| TotalFOVS | GOODFOVS | [BADCERES | BADCLOUD | BADMODEL | BADTUNED] | all |
|---|---|---|---|---|---|---|
| 98737 | 93317 | 367 | 4962 | 49 | 41 | 93317 |
| | 94.51% | 0.37% | 5.03% | 0.05% | 0.04% | 94.51% |

MAC:

| TotalFOVS | GOODFOVS | [BADCERES | BADCLOUD | BADMODEL | BADTUNED] | all |
|---|---|---|---|---|---|---|
| 98737 | 93326 | 367 | 4962 | 52 | 29 | 93326 |
| | 94.52% | 0.37% | 5.03% | 0.05% | 0.03% | 94.52% |

For the Common set made histograms of the Untuned and Tuned Fluxes
The differences are typically very small (see attached histograms).
The worst single case is 10 Wm2 in Tuned LW Where the Mac
does better job ...

| #Records | MinDif | MaxDif | Parameter |
|---|---|---|---|
| 93309 | 0.00000 | 0.00000 | CERES SW |
| 93309 | -0.00588989 | 0.0460510 | Model Ut SW |
| 93309 | -0.339233 | 0.454056 | Model TU SW |
| 93309 | 0.00000 | 0.00000 | CERES LW |
| 93309 | -2.12848 | 1.12680 | Model Ut LW |
| 93309 | -10.0573 | 0.888062 | Model TU LW |

Bottom Line :
I don't see a scientific impact dependent on processing architecture.

"Scott M. Zentz" wrote:
>
> Fred,
>
> I was hoping you would be able to look at these 2 files and see whether they are
> scientifically equivalent. They use the same code and same input files but the
> platform and compilers differ. 98 records contain differences greater than
> 1/1000th, I believe 17 records are completely different, where one record is
> default in one file but populated in another. Just let me know if anything
> jumps out at you as being better/worse or just plain wrong. Thanks alot.
>
> /CERES/sarb-1/zentz/sarb/data/out_exp/data/sarb:
>
> MAC_CER_CRSB_Aqua-FM3-MODIS_Edition1B_030034.2003062920
> SGI_CER_CRSB_Aqua-FM3-MODIS_Edition1B_030034.2003062920
>
> Scott
>
**********
**
> Scott Zentz
> Software Engineer E-Mail : s.m.zentz@larc.nasa.gov
> SAIC - CERES Data Management Phone : (757) 827 - 4863
> Mail Stop 927 Cell : (443) 340 - 8415
> One Enterprise Parkway, Suite 300 FAX: (757) 825 - 4968
> Hampton, VA 23666

--
Fred G. Rose (757)827-4649
http://srbsun.larc.nasa.gov/~rose/
f.g.rose@larc.nasa.gov

[ Attachment (application/pdf): "sgimac.pdf" 109362 bytes
Encoded with "base64" ]

## Email 31.

From: j.h.saunders@larc.nasa.gov
Date: Tue, 6 Dec 2005 14:37:13 -0500
To: cerescm@larc.nasa.gov, Erika.B.Geier@nasa.gov, S.K.Nolan@larc.nasa.gov,
L.H.Coleman@larc.nasa.gov, T.E.Caldwell@larc.nasa.gov,
s.m.zentz@larc.nasa.gov
Subject: Updated CERES InstSARB R4V3 Operator's Manual - SCCR 597

Forgot to say this was the updated version. Sorry.

The CERES Instantaneous Surface and Atmospheric Fluxes
Operator's Manual, Subsystem 5.0, Release 4,
Version 3, has been posted on the CERES Operator's
Manual Web page (http://asd-www.larc.nasa.gov/ceres/ops_man/).
This includes the pdf and tar files.

Thanks,

Joanne

## Email 32.

Date: Mon, 24 Oct 2005 09:18:26 -0400 (EDT)
From: "Thomas E. Caldwell" <caldwell>
Subject: Re: environment variable settings
To: d.e.rieger@larc.nasa.gov
Mime-Version: 1.0
Content-MD5: kOpHgN+CWczqeflwT7YO9w==

Don,

I am referring to the SARB and MOA PGEs. 5.0, 5.1, 5.4, 7.2, and 12.1.

Tom

>Date: Mon, 24 Oct 2005 09:13:42 -0400
>From: Don Rieger <d.e.rieger@larc.nasa.gov>
>User-Agent: Mozilla/5.0 (X11; U; SunOS sun4u; en-US; rv:1.0.1) Gecko/20020920
Netscape/7.0
>X-Accept-Language: en-us, en
>To: "Thomas E. Caldwell" <t.e.caldwell@larc.nasa.gov>
>Subject: Re: environment variable settings
>MIME-Version: 1.0

>Content-Transfer-Encoding: 7bit
>
>Tom
>
>We have not problem with this, but which PGEs are you talking
>about here.
>
>Don Rieger
>
>---
>
>Thomas E. Caldwell wrote:
>> Date: Fri, 21 Oct 2005 09:55:00 -0400 (EDT)
>> From: "Thomas E. Caldwell" <caldwell>
>> Subject: environment variable settings
>> To: don.e.rieger@larc.nasa.gov
>> Mime-Version: 1.0
>> Content-MD5: ntcr5b344YgK1u21+rhpWQ==
>>
>> This is Tom Caldwell at SAIC.  Several weeks ago we discussed creating an
>> environment variable to control the use of input file checking in the MOA PCF
>> generator scripts.  Our plan is to have an environment variable called
>>
>> InputCheck
>>
>> which is set to Enable by default.  You will need to set it to "Disable" to
>> cancel the input file checking and user prompts.
>>
>> Let me know if this will work OK for you.
>>
>> Tom
>>
>>
>> Thomas E. CaldwellE-mail : t.e.caldwell@larc.nasa.gov
>> SAIC - CERES Data ManagementVoice: (757) 827-4667
>> Mail Stop 927 FAX:   (757) 825-4968
>> One Enterprise Parkway, Suite 300
>> Hampton, VA  23666
>>
>
>
>--
>**********
>*RIEGER, DONALD E  D.E.RIEGER@LaRC.NASA.GOV  *

>*  EOSDIS/LaRC ASDC  SAIC  *
>*  Hampton, VA 23681-2199  Phone +1 757 864-9351  *
>

==========

Thomas E. CaldwellE-mail : t.e.caldwell@larc.nasa.gov
SAIC - CERES Data ManagementVoice: (757) 827-4667
Mail Stop 927 FAX:  (757) 825-4968
One Enterprise Parkway, Suite 300
Hampton, VA  23666

==========

## Email 33.

Date: Thu, 19 Jan 2006 18:55:26 -0500
To: cereststst@larc.nasa.gov
From: Tammy Ayers <t.o.ayers@larc.nasa.gov>
Subject: Instantaneous SARB Release Notification (SCCR 597)
Cc: cerescm@larc.nasa.gov, l.h.coleman@larc.nasa.gov,
t.e.caldwell@larc.nasa.gov, s.m.zentz@larc.nasa.gov,
Erika.B.Geier@nasa.gov, Michael.M.Little@nasa.gov

==========
CERES CM Release Notification
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Instantaneous SARB (Subsystem 5) is now available on warlock and magneto
for CODINE and operational testing.  Attached is a PDF version of the
Instantaneous SARB Delivery Memo.  This delivery is in reference to SCCR #597.

The following files were delivered to /delivery/CERES/incoming on warlock:

InstSARB_anc_R4-597.list
InstSARB_anc_R4-597.tar.Z
InstSARB_data_warlock_R4-597.list
InstSARB_data_warlock_R4-597.tar.Z
InstSARB_opman_R4V3-597.pdf
InstSARB_src_R4-597.list
InstSARB_src_R4-597.tar.Z
InstSARB_test_plan_R4V3-597.pdf

The following files were delivered to /delivery/CERES/incoming on magneto:

InstSARB_anc_R4-597.list
InstSARB_anc_R4-597.tar.Z
InstSARB_data_cluster_R4-597.list

InstSARB_data_cluster_R4-597.tar.Z
InstSARB_src_R4-597.list
InstSARB_src_R4-597.tar.Z

The delivered tar files were copied to /verify/CERES and un-tarred. The /verify/CERES/sarb directory which was the result of the un-tarring was recursively copied to /SSIT/CERES. In /SSIT/CERES/sarb, the code was successfully compiled and tested according to the subsystem's Test Plan.

Thanks,
Tammy

[ Attachment (application/pdf): "InstSARB_del_memo_R4-597.pdf" 179831 bytes
Encoded with "base64" ]

[ text/plain ] :

## Email 34.

From: j.h.saunders@larc.nasa.gov
Date: Fri, 20 Jan 2006 07:21:46 -0500
To: cerescm@larc.nasa.gov, Erika.B.Geier@nasa.gov, L.H.Coleman@larc.nasa.gov,
T.E.Caldwell@larc.nasa.gov, s.m.zentz@larc.nasa.gov
Subject: CERES InstSARB Test Plan R4V3 - SCCR-597

The CERES Instantaneous Surface and Atmospheric Fluxes Test Plan, Subsystem 5.0, Release 4, Version 3, has been posted on the CERES Test Plans Web page (http://asd-www.larc.nasa.gov/ceres/test_plans/). This includes the pdf and tar files.

Joanne